

Missouri Adaptive Enterprise Architecture

August 2002
Version: 1

State of Missouri

Agency Primer

Prepared By

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Letter of Introduction



State of Missouri

August 28, 2001

Bob Holden
Governor

Gerald E. Wethington
Chief Information Officer

Department Officials:

The State of Missouri has taken an important step in moving to the information age, the development of Missouri's Adaptive Enterprise Architecture, MAEA. Governments have grown dependant upon technology over the last 3 decades. As government introduced information technology it did so with little or no regard for a common architecture or common standards. Technology was often acquired and then a search began for some business function that could benefit from the acquisition. Transforming the culture of government to recognize information technology as a core business function is not an easy task, but an essential task none-the-less. The State of Missouri has initiated its Adaptive Enterprise Architecture program by focusing on the governance of architecture and developing a blueprint for success. The MAEA Manual and the Primer offer the guidance necessary to begin to change the culture of Missouri state government with respect to information technology investment and management.

Because architecture is such a significant change from the days of information technology silos the path for development, adoption and implementation requires the participation of all affected agencies. The MAEA will be successful in Missouri because of the approach being taken within the information technology community, an approach of participatory development and consensus development on governance, principles, guidelines, technology and standards. Missouri state agencies have willingly contributed staff time and expertise in the development of Missouri's adaptive enterprise architecture. The MAEA and the Primer are the results of their collaborative efforts and a demonstration of the progress that can be made when agencies work together to chart the course for Missouri state government in the information age.

I applaud the efforts of the Information Technology Advisory Board and both the Architecture Review Committee and Architecture Technical Committee in reaching this significant milestone. I encourage every member of Missouri's information technology community to review the MAEA and the Primer and to embrace the concepts put forth as they approach their day-to-day activities. The future of Missouri government will depend, in part, on the quality of its information technology program. The quality of that program will depend upon Missouri's ability to recognize information technology as a core business function and to manage the investments made as an enterprise asset. The tools to assist begin with this MAEA Manual and the Primer.

Sincerely,

A handwritten signature in cursive script that reads "Gerry Wethington".

Gerald E. Wethington
Chief Information Officer

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Agency Primer for the Missouri Adaptive Enterprise Architecture Program

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Purpose of the Agency Primer

The purpose of this Primer is to provide an overview of Missouri's Adaptive Enterprise Architecture (MAEA) program from a State agency perspective. Its intent is to describe the MAEA in general terms for those agency professionals not typically exposed to information technology (IT) architecture on a regular basis. The Primer focuses on key areas of contact that agency personnel may have with the MAEA. The Primer's audience will be State agency IT managers and members of IT project teams and maintenance groups. The Primer focuses on the topics in the MAEA of greatest concern to agency professionals.



What is Architecture?

In today's world, information technology is a critical enabling factor that drives industry, commerce, education, and government. Advances in technology during the past few decades have dramatically changed the way individuals, businesses, and government

organizations process, store, and transmit information. The development and use of the Internet, common and open standards, and other intelligence-oriented technologies is providing for simpler integration of systems, information and as a result, business processes. Thanks to these new technologies and the ease of integration they provide, we can buy St. Louis Rams football tickets, check the weather in Jefferson City, and make several stock market transactions in a few minutes at home before breakfast. Because the world of commerce offers such convenience and responsiveness, we have come to expect the same from government. Due to public demand, and because significant cost savings can be realized at the same time that services are dramatically improved, government has no choice but to implement appropriate information technologies. The downside of this reality is that difficulties and complexities always

The goal of statewide enterprise architecture is to enhance coordination, simplify integration, build a consistent infrastructure, and generally allow greater efficiencies in the development of information technology solutions. The intent of the Missouri Adaptive Enterprise Architecture program is to realize these goals while ensuring effective use of state resources, thereby enabling consistent, effective delivery of services to the employees, citizens, and businesses of Missouri.

accompany the introduction, coordination, and management of technology. This is especially true in large organizations such as state governments that struggle to meet the various needs of many interrelated entities.

This is where Enterprise architecture comes in. Architecture from the perspective of the entire organization, or enterprise, provides the road map for effectively managing information technology through its entire life cycle, from initial planning, through purchase and deployment, to final phase out and replacement.

The Missouri Adaptive Enterprise Architecture

To address enterprise architecture issues, Missouri's Office of Information Technology (OIT) and the Information Technology Advisory Board (ITAB) appointed an Architecture Review Committee (ARC) charged with the development of an enterprise architecture plan for the State. This plan is called the Missouri Adaptive Enterprise Architecture (MAEA) and is documented in the MAEA Manual. The Manual presents the guidance and approach for development and administration of the MAEA.

The MAEA will provide answers to many questions such as:

- What can the MAEA do to help my agency accomplish our goals?
- Where can agencies find out more information about the MAEA?
- How can my agency help in developing the ideas and suggestions in the MAEA program?
- How will the MAEA impact my projects?
- Is there lesson-learned information from others who have led the way?

The MAEA is adaptive because mechanisms are in place to allow it to evolve with the ever-changing face of information technology and the needs of State agencies. The MAEA was created from a statewide perspective, so it truly

is an enterprise architecture. Eventually, the MAEA will provide the standards and specifications that define how the information systems of Missouri state agencies are and will be built and managed. It will define and categorize the products, configurations, and compliances (guidelines, standards, and/or legislation) regarding the information technology in use or being considered within the State.

The MAEA covers the entire spectrum of IT environments, including networks, applications, databases, messaging, interfacing, middleware, security, and other relevant domains. Through the MAEA, guidelines will be developed to facilitate access and consolidation, provide security, eliminate duplication, and ensure that all agency IT solutions are extensible, scalable, and more easily integrated.

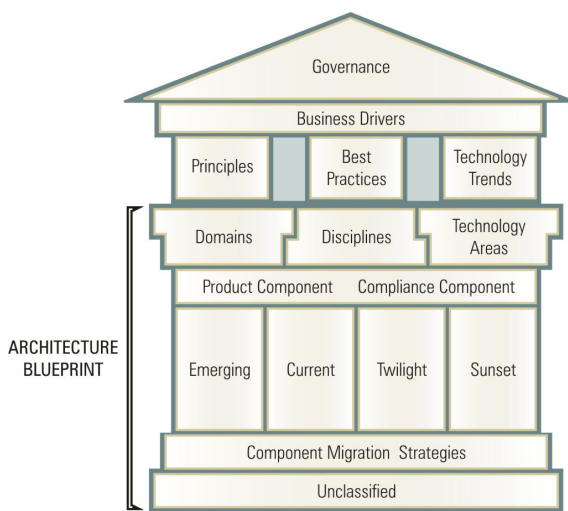
Architectural standards will require an ongoing commitment by the State and by IT managers and stakeholders within State agencies. The evolution of new products, technology trends, business trends, and user demands will require a constant update to architectural standards to ensure that data and services remain accessible. Compliance with architectural standards will evolve over a long period of time. The end result will be a more effective use of agency resources and a more efficient delivery of services to the citizens of the State.

Enterprise Architecture Framework

The ARC has identified IT architectural principles, business drivers, processes, and components relevant to the State of Missouri. Areas of technology pertinent to the implementation of e-government are categorized into natural divisions called "domains." The ARC has developed templates for producing architecture documents for each IT domain. It also developed the organizational roles, management responsibilities, and various architectural processes that define how the enterprise architecture is developed, maintained, and managed.

For each defined domain, a Domain Committee is established to detail the architecture for that domain using a standard architecture template. These committees are comprised of State agency subject matter experts and key stakeholders in the application of these domains.

The following graphic offers one way of conceptualizing the framework upon which the MAEA was built.



Enterprise Architecture Framework

The “roof” of the enterprise architecture framework represents the roles and responsibilities of the personnel who support and govern the enterprise architecture. Their efforts are driven and guided by the business needs of the enterprise. The enterprise architecture pillars (principles, best practices, and technology trends) are overarching; they hold true throughout the architecture. The domains, disciplines and technology areas are the building blocks that make up the architecture. They are its foundation and its logical divisions such as privacy, security, and the IT infrastructure. The process of documenting the architecture blueprint classifies product and compliance components into categories such as emerging, current, twilight, and sunset including documenting critical component migration strategies.

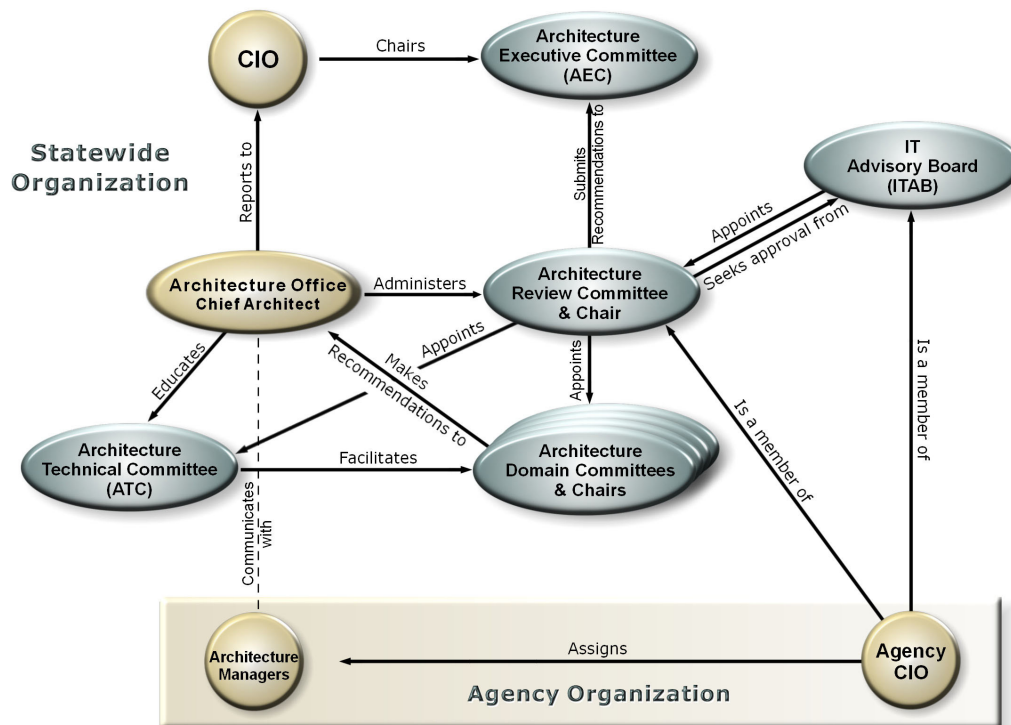
One of the key factors in developing an adaptive enterprise architecture is the understanding of the enterprise business, which means the business of each State agency and organization. The enterprise business drivers plot the business direction of the enterprise and help to ensure that the application of information technology supports the business of the State and its individual agencies.

The enterprise architecture pillars form the basis of the architecture. In IT architecture, the enterprise architecture principles are the general rules that hold true across the architecture. In a sense, principles define the spirit of the architecture, in that they are an attempt to capture the thinking behind it. Best practices identify industry processes related to the implementation of the architecture. Technology trends within the industry have an effect on the deployment of information technology. Identifying these trends and having an awareness of their impact will allow IT decision-makers to develop more informed, effective decisions. The MAEA Manual identifies the principles, best practices, and technology trends driving the MAEA.

Architecture Governance

The support of enterprise architecture requires the involvement of personnel in a variety of roles and responsibilities. In the MAEA Manual, the ARC has identified the roles and organizational duties at both the State and agency level. The following graphic identifies key organizational roles and management responsibilities for the MAEA. Further discussion of the identified roles and responsibilities is provided in the MAEA Manual.

As the following diagram suggests, State agency personnel will play key roles in the governance of the MAEA. This means that agency thinking will largely influence the development of Missouri state government enterprise architecture, and therefore the completed MAEA will be focused on and responsive to addressing State agency needs and challenges. Specific MAEA governance



Missouri Adaptive Enterprise Architecture Governance Model

roles supported by agency personnel will include:

- Architecture Executive Committee, Department Director Level
- Architecture Review Committee, IT Director Level or Agency CIO
- Architecture Technical Committee, Selected Agency Technologists
- Architecture Domain Committee, Selected Agency Subject Matter Experts
- IT Architecture Managers, Selected Agency Technologists

An additional agency governance role for Enterprise Architecture not identified in the governance graphic applies to the agency project teams and maintenance groups. This role includes the responsibility for coordination of new development and maintenance efforts for architecture compliance. These efforts are coordinated through the Agency IT Architecture Manager.

OIT will provide the administrative, educational, and oversight resources necessary to keep the MAEA program moving forward in a consistent fashion.

The MAEA and State Government Agencies

Missouri state agency IT personnel will be heavily involved in fleshing out the details of the MAEA framework. For example, agency managers will provide information to help in determining the MAEA business drivers and enterprise architecture pillars. And agency subject matter experts will sit on the Domain Committees tasked with actually developing the enterprise architecture standards and guidelines.

Once the MAEA is completed, it will answer very specific IT-related questions important to State agencies, such as:

- What product has the State chosen for a particular technology area (For example: What is the current Web server for an NT box)?
- What is the recommended migration strategy for replacing various IT products?
- Has any other agency posted their configuration procedures for the product?
- Does the State have a set of coding standards that I can give to a consulting firm to verify that they are building to the State's specifications?

Architecture Compliance Process

Of particular interest to agency IT professionals is the MAEA compliance process. Here is where agency IT professionals will interact with the enterprise architecture during the processes of procuring or developing IT assets, managing them through their life cycles, and planning for their replacement or upgrade.

The State of Missouri IT community has undertaken the development of enterprise architecture with the understanding that it is an appropriate and tactically sound approach to managing information technology from a statewide perspective. With general consensus achieved, it is assumed that compliance will be a voluntary process. Agencies will adhere to defined architectural strategies because it is an expedient, efficient, and globally accepted process.

The essence of the approval process includes a variety of interests and community perspectives, including business needs, IT strategies, budgetary views, and legislative activities. Agencies should work toward making their initiatives compliant, or work toward changing the standards. The architecture is not intended to restrict organizations, but is intended to enhance coordination and integration, simplify implementation, build a consistent infrastructure, and generally provide for greater efficiencies.

Circumstances will inevitably occur, however, that preclude the use of the documented standards. To address these occasions, a formal compliance process has been devised that allows for the review and acceptance of variances from the statewide architecture. Agencies will be allowed to submit deviations. These deviations should be presented with an appropriate business case stating the reasons for the variance. Legitimate business cases will be reviewed and those accepted will be documented as approved variances.

This means that State agency IT professionals will not confront a rigid and inflexible wall of rules and requirements when developing IT solutions to meet agency needs. Instead, through the compliance process, the MAEA will help agency IT professionals craft the best solutions, rather than hinder them.

Agency activities in the architecture compliance process may include:

- Reviewing agency IT project or maintenance activities for MAEA compliance (IT Architecture Manager)
- Identifying which IT projects or maintenance activities need to go through architecture compliance verification, based on criteria provided in the MAEA Manual – Architecture Compliance Process. (Project Teams, Maintenance Groups and/or IT Architecture Manager)
- Requesting architecture help in determining technology solutions or in validating suggested technology solutions (Project Teams, Maintenance Groups and/or IT Architecture Manager)
- Evaluate technology solutions provided by EA Program for new technical areas. (Project Teams, Maintenance Groups and/or IT Architecture Manager)
- Creating an architecture variance business case when the MAEA recommended technology solution will not work for a given need. (IT Architecture Manager)

Architecture Blueprint

The MAEA as a whole addresses a range of issues, including enterprise architecture governance and compliance. The MAEA Blueprint, on the other hand, contains the specific architecture standards and guidelines themselves. The MAEA Blueprint, when completed, will be the single source within the MAEA that all IT professionals across the State of Missouri will go to for guidance on the full range of IT procurement, procedural, and development issues. Questions that State IT professionals may have, such as which product to purchase, what network configuration to implement, or when to retire an older system, plus many other related questions, will be answered by the MAEA Blueprint. Details of the structure and initial MAEA Blueprints are documented in the MAEA Manual Appendix.

MAEA Educational and Work Sessions

For the MAEA program to succeed, information about it must be communicated to State agency professionals who will actually work with it and make decisions based on it. Also, much work is still required by the Domain Committees to complete the MAEA individual domain architectures. The State of Missouri's approach to domain architecture is organized around three sessions intended to progressively educate each Domain Committee on architecture. The goal is ultimately to develop an appropriate level of detail for each domain.

The initial educational session is an architecture primer that provides an overview of architecture and identifies the approach that the State of Missouri is taking for development and maintenance of architecture for the State. This session will not address specific issues, but is intended to provide an understanding of the concepts of architecture. These sessions will be held on an on-going basis initially to educate the current stakeholders about architecture and routinely thereafter to educate new stakeholders. The second set of sessions will be facilitated sessions tailored to each domain.

Each session will define the specific domain and provide the essential understanding of how to complete the documentation of standards and standard products, etc. associated with the domain. The third set of sessions will include facilitated working sessions that are also domain specific. In these sessions the actual components of the MAEA Blueprint will be derived and documented.

MAEA Repository

For the MAEA program to succeed, information about it must be communicated to all stakeholders, especially State agency IT professionals who will actually work with it and make decisions based on it. A genuine commitment to the MAEA program is necessary for its success, and this commitment will grow through awareness and understanding of the MAEA. A repository of MAEA-related information has been created by OIT. The MAEA repository will contain:

- The MAEA Manual
- Architecture Blueprint Templates
- Educational Material
- The MAEA Blueprint

Information about the MAEA will accumulate from a variety of sources, including:

- Architecture Reviews
- Approved Architecture Blueprints
- Rejected Architecture Blueprints

As it accumulates, the information will be added to the MAEA Repository and made accessible on the Internet. If agency IT professionals and other stakeholders cannot find what they need by accessing the MAEA Repository through the Internet, they can e-mail OIT to get answers to their questions based on data stored within the Repository.



MAEA Success

Ultimately, for the MAEA program to be successful, Missouri state agency stakeholders must do more than allow the MAEA to occur, or simply follow legislative mandates or appointed leadership, they must take ownership of the MAEA and drive its development and implementation. Through increased awareness of the MAEA program, State agencies will recognize the value and importance of the MAEA. And through participation in the governance organization and Domain Committees, the agencies will mold the MAEA into a powerful tool to help them achieve their own goals.